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HEALTH AND SAFETY PLAN

PHASE III REMEDIAL INVESTIGATION/ FEASIBILITY STUDY

BALLY ENGINEERED STRUCTURES SITE BALLY, PENNSYLVANIA

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BALLY ENGINEERED STRUCTURES SITE
BALLY, PENNSYLVANIA

PREPARED FOR

BALLY ENGINEERED STRUCTURES, INC.

SEPTEMBER 23, 1987

PROJECT NO. 87313

REMCOR, INC.
PITTSBURGH, PENNSYLVANIA

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1.0 INTRODUCTION

This Health and Safety Plan (HASP) presents the program to be implemented by Remcor, Inc. (Remcor) during the Phase III Remedial Investigation/Feasibility Study (RI/FS) at the Bally Engineered Structures (BES) facility in Bally, Pennsylvania. This document and the Field Sampling and Analysis Plan (FSAP) (Remcor, September 1987a) constitute the Remedial Investigation Site Operations Plan (RISOP) for the BES site. As such, they supplement the RI/FS Work Plan (Remcor, September 1987b). Figure 1-1 has been provided as a general site location map; additional site details may be found in the RI/FS Work Plan.

The focus of the RI field study will be a hydrogeologic investigation of the aquifer in the vicinity of the BES plant. Most field activities will be conducted in a residential area surrounding the plant. Since these areas are remote from manufacturing activities and/or potential sources of ground water contamination, the minimal risk to field personnel or nearby residents due to the drilling operations far outweighs any potential risk due to contaminant release. Any possible risk from drilling operations in residential areas will be effectively managed as outlined in this plan. This HASP is based on site characterization and hazard assessment as reported in the RI/FS Work Plan (September 1987b).

1.1 PROGRAM OBJECTIVES

Remcor's policy is to conduct all on-site activities so that the health and safety of the project personnel and the public are protected.

The objectives of the HASP are to provide safe working conditions for personnel at the site, as well as to protect visitors and nearby residents. Protective measures have been selected commensurate with the potential hazards, and at no time will work be performed in a manner which conflicts with the intent or concerns expressed in this plan. The specific measures outlined herein will be evaluated on an ongoing basis and modified as appropriate and necessary to meet the overall program objectives.

This HASP has been developed to conform to and comply with the following:

- All applicable BES plant standards and guidelines
- U.S. Environmental Protection Agency (EPA) - 40 Code of Federal Regulations (CFR) 260 to 267
- U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) regulations, including:
  - 29 CFR 1910 Subpart C; General Safety and Health Provisions
  - 29 CFR 1910 Subpart I; Personal Protective Equipment
  - 29 CFR 1910 Subpart Z; Toxic and Hazardous Substances
  - 29 CFR 1926 Subpart C; Construction Standards - General Safety and Health Provisions
  - 29 CFR 1910.120; Hazardous Waste Operations and Emergency Response - Interim Final Rule.

Where there is conflict or overlap in the above regulations as they apply to hazardous waste operations, the provision more protective of employee safety and health is applied.

1.2 PROGRAM ORGANIZATION AND ADMINISTRATION

The health and safety requirements will be implemented by the following key project staff:

- Project Director - Officer of Remcor, ultimately responsible for project technical scope, schedule, budget, and health and safety of investigative personnel
- Project Manager/Project Coordinator - Responsible for all project activities, including adherence to and implementation of procedures described herein

- Corporate Health and Safety Officer - Provides corporate health and safety support to the project staff, is responsible for general development of the site plan and monitoring of compliance with the plan; reports to the project manager/project coordinator, and project director

- On-Site Project Superintendent or Lead Investigator - Responsible for executing project requirements on site, including health and safety requirements

- Field Health and Safety Officer - Responsible for field implementation and day-to-day implementation of the health and safety program. The on-site project superintendent or lead investigator may function as field health and safety officer.

- Technical Staff - All Remcor field personnel engaged in site activities are required to be familiar with and to comply with the provisions of this plan and other such directives as deemed appropriate by project management

- Subcontractors - A drilling firm skilled in installation of monitoring wells will be selected as the primary drilling subcontractor. The services of a second drilling firm are anticipated to be needed to perform a single core hole in suspected bedrock and to do hollow-stem augering in suspected waste source areas. Subcontract assistance may also be required in performing field survey work. Appalachian Coal Surveys (Pittsburgh, Pennsylvania) will provide geophysical borehole logging support. Subcontractor personnel engaged in field activities will be advised on the content of this HASP and will conform to its requirements.

All personnel are encouraged to offer ideas, suggestions, or recommendations regarding operational conditions, procedures or practices that may enhance the protection of affected employees.

The field health and safety officer will:

- Supervise the day-to-day implementation of the HASP

- Interact with project personnel on health and safety matters

- Investigate and report accidents, personal injuries, or overexposures
- Maintain liaison between field activities and the Site Superintendent, the project manager, and the corporate health and safety officer
- Perform air quality and personal monitoring, as required
- Maintain site health and safety records
- Conduct site health and safety meetings.

Any modifications to this HASP will be documented in the site records, as specified in the Field Sampling and Analysis Plan (FSAP) (Remcor, September 1987a).

2.0 SITE CHARACTERIZATION AND HAZARD ASSESSMENT

2.1 SITE HISTORY

2.1.1 BES Plant Facility

2.1.1.1 Overview

Initial manufacturing operations at the Bally plant site began in the 1930s with the production of high-quality wooden cabinets and cedar chests. Cabinet production continued until the 1940s when the plant was commissioned by the government to assist in the war effort.

In the 1950s, BCC turned to the manufacture of continuous-line, insulated meat display cases. The outer shell of these display cases was provided with a porcelain finish, and BCC also became a major supplier of porcelain panels for use as building facades.

The insulation used in the meat display cases during the 1950s was conventional fiberglass batting. In the late 1950s, however, BCC began experimenting with the use of urethane foam insulation to replace the batting. Actual use of urethane foam in the production process did not begin until the early to mid-1960s. Manufacture of the meat display cases was discontinued about 1969, and the production capability of the plant was fully dedicated to the manufacture of insulated panels.

BCC remained privately held until 1972, when it was purchased by the Sunbeam Corporation. BCC became a subsidiary of Allegheny International, Inc. (AI) with AI's acquisition of Sunbeam in 1982. BCC was renamed Bally Engineered Structures, Inc. in 1984, in response to the increased emphasis on the manufacture of insulated panels and product diversification.

2.1.1.2 Use of Hazardous Materials

Hazardous chemicals have been used at the Bally plant in two general areas since the 1950s:

- Pickling acids were used to prepare the surface of the metal shells for the display cases to receive the porcelain coatings.
- Degreasing agents were used to clean metal surfaces to ensure a good bond with urethane foam insulation, as well as to degrease small metal parts used in interlocking the insulated panels to form structures.

The EPA Environmental Photographic Interpretation Center (EPIC) archival aerial photographs of the plant site show the presence of four lagoon areas at the site from 1955 through 1970 (EPIC, August 1986). The approximate locations of each of these lagoons are shown in Figure 2-1, which also shows the plant buildings in plan view.

To date, much of the discussion of potential sources of the volatile organic contamination from the Bally plant has focused on these four lagoons. As receiving areas for liquid wastes, there is some reason to suspect that some of these lagoons may have received spent degreasing agents (i.e., volatile organics). These lagoons were reportedly shallow (i.e., maximum depth not greater than one foot), diked structures, built to contain the spent pickling liquors from the porcelain plating operations. Based on PADER analyses, these lagoons were characterized by elevated metals and sulfate levels, rather than by organic contamination.

The first series of two lagoons was apparently constructed prior to May 1955, based on a May 2, 1955 aerial photograph (EPIC, August 1986) and was backfilled prior to the mid-1960s as the plant buildings expanded to the southwest. At about this time, a series of two other lagoons was apparently constructed further to the south, as shown in Figure 2-1. The latter two lagoons were eliminated with the construction of the present plant office in 1970. These lagoons may not have been used

after the late 1960s as production of the porcelain-faced meat display cases had ceased.

Initial use of degreasing agents at the Bally plant was concurrent with the switch to urethane foam as the insulation material for the meat display cases. A 2,000-gallon capacity tank was located at the former degreasing area in the northeastern portion of the plant, as shown in Figure 2-1. Prior to the application of the porcelain shells and the foam insulation, an overhead monorail crane was used to dip the entire case into the tank. Following dipping, the cases were set on the concrete floor and permitted to dry before being returned to the production line. Use of this degreasing tank was discontinued about 1969, with the end of the case manufacturing operations.

A second degreasing area, shown in Figure 2-1 as the "small parts degreasing area," has been in use since the early 1960s for degreasing small parts used in interlocking the insulated panels. The tank at this location has a capacity of 600 gallons, but it usually contains less than 400 gallons of solvent.

Flushing agents have also been used to clean molds and urethane foam injection nozzles between mold shots. This activity has been ongoing since initial use of urethane foam in the production process in the mid-1960s.

All spent degreasing agents have been drummed and disposed off site through the services of a contract hauler and a disposer. The flushing agent is drummed and sent to a reprocessor; about 60 percent of the spent flushing agent is returned to the Bally plant, while the remainder is disposed by the reprocessor.

In summary, the initial use of pickling acids at the BES site occurred in the mid-1950s with the production of continuous line meat display

cases. Solvents were not used in the production process until the mid-1960s, with the advent of urethane foam as the insulation material in the meat cases and insulated panels. Urethane foam insulation was used in the manufacture of the meat display cases from 1964 until the discontinuation of this line in 1969. The solvent used in the former degreasing area (2,000-gallon tank) was exclusively trichloroethylene (TCE).

The following chronology is provided for use of degreasing agents in the small parts degreasing tank (600-gallon tank):

August 1986 to present:	Eaken Saf-T-Sol 31
April 23, 1980 to August 1986:	Eaken Saf-T-Sol 15
Prior to April 23, 1980:	Eaken Saf-T-Sol 5

There is no reference in the plant operating records to specific degreasing agents prior to 1980. In addition to the Saf-T-Sol 5, chlorothane may have been used during this period.

Flushing solvents used in cleaning the injection nozzles in the foaming department follow:

January 1987 to present:	Methylene chloride (Chemical Solvents, Inc. SP-713)
July 1986 to January 1987:	Eaken Saf-T-Sol 12
February 1986 to July 1986:	Chemical Solvents, Inc. SP-711
July 1976 to February 1986:	Eaken Saf-T-Sol 12
October 1973 to July 1976:	Chlorothane VG
Prior to October 1973:	TCE

Material Safety Data Sheets (MSDSs) for each of the solvents used are provided in Appendix A to the RI/FS Work Plan (Remcor, September 1987b). General compositions are identified as follows:

Solvent	Active Agent/Constituents
SP-711	TCE
SP-713	Methylene Chloride
Chlorothane VG	1,1,1-Trichloroethane (TCA)
Saf-T-Sol 5 Tetrachloroethylene	Methylene Chloride
Saf-T-Sol 12 Methanol Toluene	Methylene Chloride
Saf-T-Sol 15	TCA
Saf-T-Sol 31	Hydrocarbons (no TCE/TCA)

2.2 CONTAMINANTS FOUND AT THE SITE

The contaminants of main concern on site are located in the ground water and consist of TCE, TCA, tetrachloroethylene (PCE), and 1,1-dichloroethylene (DCE).

The contaminants are potentially toxic to humans via dermal exposure, inhalation and ingestion. Toxicity information for each chemical is presented in Appendix A.

2.3 JOB TASKS

Job tasks to be performed include:

- Drilling, boring, and sampling of soil
- Ground survey
- Geophysical borehole logging
- Monitoring well installation
- Ground water sampling
- Aquifer performance testing (pumping test).

The majority of the work involves monitoring well installation remote from the BES site plant. These locations will be in open areas where ground water contaminant levels are lower than in the plant vicinity. The potential for exposure to hazardous substances at these remote locations is extremely low.

Chapter 2.0 of the Field Sampling and Analysis Plan (Remcor, September 1987a) also contains a description of the site investigation activities.

2.4 HAZARD ASSESSMENT

The potential hazards present at the site are the result of the relationship between the site contaminants and specific job tasks. Under present conditions there is no substantial risk to investigative personnel through direct contact with site contaminants (i.e., in ground water).

The highest hazard potential is related to the single monitoring well installation within the plant (87-13S) and to subsurface soil sampling in former waste disposal areas. Figure 2-2 summarizes proposed waste characterization sampling locations at the former lagoons and degreasing areas. Figure 2-3 depicts the proposed boring and well installation locations.

In all cases, the exposure pathways of concern are dermal contact and inhalation. Based on the hazard assessment, the protective equipment required is defined by work area and work activity. The majority of the monitoring well installation will be in areas remote from the actual plant site with the lowest hazard potential due to minimal contamination in the ground water. The areas remote from the plant site include all sites in residential areas.

3.0 SITE CONTROL

The site control plan is designed to minimize the potential for contamination of employees and the spread of contamination off site. The site control program includes:

- Site mapping (Figures 1-1 and 2-1)
- Site work zones
- The "Buddy System"
- Site communications
- Safe work procedures
- Medical assistance
- General site access
- Reporting and recordkeeping.

3.1 SITE MAP

Figures 1-1 and 2-1 show the site facilities and boundaries. BES owns and controls only a small portion of the overall study area within the Borough of Bally. The site control program applies specifically to the BES-owned facilities. During the conduct of work, Remcor employees who enter property owned by the Borough of Bally and/or privately owned property may do so only after notification and approval of appropriate representatives/owners. All work performed on Borough property or privately-owned property will be performed in such a manner to protect Remcor employees and the public from any adverse health and safety effects.

3.2 SITE WORK ZONES

3.2.1 BES Plant Site Activities

The establishment of work zones for activities to be performed on BES property will help ensure that personnel are properly protected against hazards in the work area, and to contain contamination within controlled areas.

The work areas will be divided into three zones:

- Exclusion Zone
- Contamination Reduction Zone (CRZ)
- Support Zone.

The exclusion zone is the innermost area of the work zones. This area is where significant contamination exists or could occur. The exclusion zone is established with consideration of the following elements:

- Potential for presence of vapor, gases, or fumes
- Safe distance required in case of explosion or fire.

These requirements are considered operative only for the soil boring within the former lagoons and the current and former degreasing areas, as well as for the single well installation in the former degreasing area. All personnel must wear required personal protective equipment (Chapter 6.0).

The CRZ is the transition area between the exclusion zone and the support zone. The degree of contamination is reduced as one moves from the exclusion zone to the support zone.

CRZ activities include:

- Decontamination of equipment, personnel, and samples
- Emergency response activities (discussed in Chapter 10.0)
- Equipment resupply (e.g., protective equipment, sampling equipment, etc.)
- Temporary rest area for workers.

The support zone is a clean area where supervisors, administrators, and support personnel may be located. The support zone may contain any or all of the following:

- Records, bookkeeping, telephones
- Normal work clothes
- Emergency telephone numbers
- Route maps or site maps
- Company vehicles
- Clean supplies and first-aid supplies.

Whenever feasible, the support zone should be located upwind of the exclusion zone.

3.2.2 Residential Area (Off-Plant Site) Activities

Specific site work zones are not necessary in residential areas due to the very low potential for chemical contamination in these areas. Physical hazards are of more concern than chemical hazards. Each site will be controlled to the extent necessary to protect residents from physical hazards associated with each operation. The drill rigs will be barricaded to prevent residents and visitors from contacting parts of the rigs that have the potential to cause injury. Residents will be notified 24 hours prior to the start of drilling operations. The drilling operations will be performed during daylight hours and only at night with adequate illumination if absolutely necessary. The hole locations will be placed as far away from habitations as technically feasible.

3.3 BUDDY SYSTEM

Activities in the exclusion areas will be conducted by a team of at least two people who will be able to:

- Provide his/her partner with assistance
- Observe his/her partner for signs of chemical exposure or heat stress
- Observe protective clothing and equipment for integrity and proper functioning
- Go for help and/or provide assistance in the event of an emergency.

3.4 SITE COMMUNICATIONS

The field health and safety supervisor is responsible for establishment of on-site communications procedures. For normal on-site activities, communications between workers and support zone personnel will be primarily verbal; visual signs may be used for line-of-sight communications when respirators or distance interferes with normal verbal communications.

The Project Manager is responsible for developing communication procedures between site personnel and BES personnel. Chapter 10.0, Emergency Response, discusses specific communication procedures in the event of an emergency or release of site contaminants.

3.5 SAFE WORK PRACTICES

The field health and safety supervisor and the project manager are responsible for safe work practices. Each Remcor employee and those of any subcontractors are required to perform his/her work in such a way that places neither himself nor others in an unsafe situation. Written work safety plans and standard operating procedures will be developed as needed based on site pre-work meetings.

3.6 MEDICAL ASSISTANCE

If a person working on site becomes ill, is overexposed, or is physically injured, Red Cross or equivalent first-aid procedures will be administered by qualified on-site personnel. Depending upon the severity of the incident, emergency medical response may be sought (Bally Ambulance Service, telephone number 845-7200). Additional medical assistance is detailed in Chapter 10.0, Emergency Response.

3.7 GENERAL SITE ACCESS

BES is an active, operating facility and access to BES property, including work areas, will be controlled by BES management. Access to work zones outside BES property will be controlled by Remcor. A site visitor's log (Remcor Form HS-5, see Appendix B) will be maintained to

document site visits by non-project personnel. Access to the exclusion zone will be limited to properly trained and protected individuals.

3.8 SITE REPORTING AND RECORDKEEPING

Records of health and safety activities conducted at the site will be maintained, including records of evaluations of potential hazards and control measures taken. The records will document monitored organic vapor and exposure levels. Remcor site and subcontractor personnel will be informed of potential exposure levels and the protective measures required. (Refer to Section 5.3 for employee recordkeeping requirements.)

Logs and reports describing the implementation of the Personnel Protection Program shall be maintained, including training logs, daily logs, and weekly reports when appropriate. Examples of specific Remcor forms have been included in Appendix B.

4.0 TRAINING

4.1 GENERAL TRAINING REQUIREMENTS

All Remcor employees, at the time of site job assignment, shall have received a minimum of 40 hours of classroom or off-site instruction and a minimum of three days on-site training under the supervision of a trained, experienced employee. Employees whose work experience and/or previous training shows the equivalent of this training shall be considered as meeting the initial site training requirements.

On-site management and supervisors directly responsible for the supervision of employees engaged in hazardous waste operations shall, in addition to the training requirements above, receive a minimum of eight hours of specialized training in the management of hazardous waste operations or shall show by work experience the equivalent of such training.

Subcontractor personnel will not be required to have the 40 hours training as required by 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response-Interim Final Rule." The nature of work presents very little potential for exposure to sufficient quantities of site contaminants to cause any adverse effects. The amount of contaminant in the ground water is in the parts per billion (ppb) range and is diluted so as to not constitute a hazardous substance as outlined by OSHA (Personal Communication with John Morris, April 22, 1987). Remcor will provide subcontractor personnel with information regarding site-specific health and safety procedures prior to initiation of site activities.

A record of training shall be maintained in each Remcor employee's file, along with documentation of training equivalency. Site-specific training logs shall be maintained with the project file.

4.2 SITE TRAINING

The field health and safety supervisor(s), in conjunction with the health and safety officer, will design and implement a training program for all site employees as necessary to complement general training discussed above. Training objectives include:

- To make workers aware of potential hazards that they may encounter
- To provide the knowledge and skills necessary to perform the work with minimal risk to worker health and safety
- To make workers aware of the proper use and limitations of health and safety equipment
- To ensure that workers can safely avoid or escape from emergencies.

All employees with the potential for exposure to hazardous substances or safety hazards shall be thoroughly trained in the following:

- Names of personnel and alternates responsible for site health and safety
- Safety, health, and other hazards present on the site
- Use of necessary personal protective equipment
- Work practices which minimize risks from hazards
- Safe use of engineering controls and equipment on site
- Medical surveillance requirements
- Site control measures
- Decontamination procedures
- Site standard operating procedures and materials handling
- Emergency response.

On-site follow-up training sessions will be held to discuss changes in standard operating procedures or provide additional information. During drilling activities, anticipated to be about five weeks in duration, weekly meetings of site personnel will be conducted by the health and safety supervisor and will cover proposed work activities, changes in exclusion area configurations, and any modifications to the personnel protection program. A log will be kept of the training sessions, the participants, and the subjects discussed.

5.0 MEDICAL SURVEILLANCE

5.1 PRE-EMPLOYMENT SCREENING

Prior to engaging in work at hazardous waste sites, all Remcor employees will undergo pre-employment medical screening. This screening will include:

- Medical history
- Occupational history
- Physical examination
- Determination of fitness to work wearing protective equipment
- Baseline laboratory studies.

The corporate health and safety officer is responsible for scheduling medical examinations, selecting appropriate clinics or physicians, reviewing physicians' reports, and maintaining employee medical files. Employee medical files are confidential and will not be released without the express written approval of the employee. A copy of all physicians' reports and medical monitoring data will be made available to the employee if requested. Repeat tests or additional tests or examinations recommended by the physician, based on the initial medical screening and related to the employee's ability to work in hazardous environments, will be arranged by the Corporate Health and Safety Officer.

It will not be necessary for subcontractor personnel to undergo a pre-employment screening. Respiratory protection is not anticipated at any of the work sites and any chemical exposure at the sites will be only through contact with environmental media.

5.2 PERIODIC MEDICAL EXAMINATIONS

Remcor employees engaged in work with potential exposure to hazardous materials will undergo a yearly update of medical and occupational history and a yearly physical examination. More frequent medical examinations consultations, and/or laboratory testing will be provided:

- For employees who, in an emergency situation, may have been exposed to hazardous substances at or near permissable exposure limits (PEL), discussed in Chapter 6.0

- As soon as possible, upon notification by an employee, that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards

- If the examining physician determines that an increased frequency of examination is medically required.

The corporate health and safety officer will arrange for periodic medical exams and maintain records in the employee's medical file.

5.3 INFORMATION PROVIDED TO THE PHYSICIAN

Remcor will provide the following information to the examining physician:

- A copy of OSHA 29 CFR 1910.12, Hazardous Waste Operations and Emergency Response, and its appendices

- A letter (Remcor Form HS-5, Appendix B) providing:

  - A description of the work performed by Remcor and the potential for exposure to hazardous substances

  - A description of employee duties which involve the potential for exposure to hazardous substances

  - Potential exposure levels of employees

  - A description of personal protective equipment which may be required

- Information not readily available to the physician relating to previous examinations or emergency situations involving potential exposure to hazardous substances.

5.4 MEDICAL RECORDS

All medical records, including pre-employment medical screening, periodic medical exams, emergency and nonemergency treatment records, and accident reports, shall be maintained in accordance with the following:

- OSHA 29 CFR 1910.20 - Medical Records
- OSHA 29 CFR 1904 - Injuries, Illnesses, and Annual Summaries.

5.5 TERMINATION EXAMINATION

Upon termination from employment, all Remcor employees whose work involved potential exposure to hazardous materials will be provided a termination examination. Records of the termination examination will be maintained in accordance with 29 CFR Subpart C 1910.20. Employees will be notified regarding termination physical examination requirements using form HS-6 (Appendix B).

6.0 ENGINEERING CONTROLS, WORK PRACTICES, AND PERSONAL PROTECTIVE EQUIPMENT PROGRAM

6.1 ENGINEERING CONTROLS AND WORK PRACTICES

Whenever feasible during the conduct of site activities, engineering controls and work practices will be instituted to reduce and maintain employee exposure to or below the PELs. The PELs for contaminants on site are as follows:

- Trichloroethylene - 100 ppm
- 1,1,1-Trichloroethane - 350 ppm
- Tetrachloroethylene - 100 ppm
- 1,1-Dichloroethylene - 200 ppm.

Work practices that will be instituted include the following:

- Only essential personnel will be present during active work in exclusion zones.
- Whenever feasible, employees will be located upwind of possible airborne hazards.

Additional engineering controls and work practices may be evaluated and implemented for task-specific site activities.

Whenever engineering controls and work practices are not feasible, personal protective equipment (PPE) will be used to protect employees from site hazards.

6.2 PERSONAL PROTECTIVE EQUIPMENT

The purpose of Remcor's PPE program is twofold:

- To protect workers from safety and health hazards, and
- To prevent injury or exposure to workers from incorrect use and/or malfunction of PPE.

To accomplish these objectives, levels of protection are established which correspond to site hazards and job tasks, and each employee will

be trained in the proper use and care of PPE required for his/her job assignment.

No single combination of protective equipment and clothing is capable of protecting against all hazards. In addition, the use of PPE can itself create significant worker hazards, such as heat stress, and impaired vision, mobility and communication. In general, the greater the level of PPE, the greater the associated risks. Overprotection as well as underprotection can be hazardous and should be avoided.

The field health and safety officer is responsible for the day-to-day evaluation of the effectiveness and appropriateness of PPE and will make decisions whether to upgrade, downgrade, or otherwise modify the level of protection to match the tasks at hand. Results from air monitoring, performance of PPE materials, potential exposure routes, etc., will be used to select appropriate level of PPE to be used.

The following levels of protection are patterned after those established by OSHA in 29 CFR 1910.120, Appendix A, and will be followed as the initial levels of protection for site activities.

In accordance with the OSHA standards, only PPE Levels C and D will be required for the RI field investigation.

6.2.1 Levels of Protection

6.2.1.1 Level C

Level C provides skin and eye protection.

Level C equipment includes:

- Chemical-resistant clothing
- Chemical-resistant boots or overboots
- Chemical-resistant gloves
- Chemical-resistant or cotton undergloves*
- Hard hat

- Safety glasses with side shields or monogoggles
- Dust mask*
- Escape mask.*

Level C should be used when:

- Air monitoring data confirms the absence of organic vapor hazards.
- Job tasks may result in contact with dilute, environmental contaminants (e.g., water, soil, etc.).

6.2.1.2 Level D

Level D is the minimum protection required.

Level D equipment includes:

- Coveralls or work dress
- Hard hat
- Safety glasses
- Work shoes
- Gloves.*

Level D protection should be selected when:

- Work functions preclude potential for unexpected contact with hazardous materials.

6.3 GENERAL PRACTICES

The level of protection selected for each task at the site has been selected based upon the potential for contact with contaminants.

6.3.1 BES Plant Site Activities

The activities include sampling of subsoils within suspected source areas (former lagoons, former and current degreasing areas). They also include installation and sampling of a single monitoring well at the

*Optional at the discretion of the field health and safety officer.

former degreasing area, the plant site well, and five monitoring wells installed during a previous Phase II RI study. Surveyed locations will be provided for all sampling points, the monitoring well, and specific points of reference within the plant.

The level of protection selected for this work includes the following personal protective equipment:

- Chemical-resistant clothing
- Chemical-resistant boots or overboots
- Chemical-resistant gloves
- Hard hat
- Safety glasses
- Hearing protection, as appropriate
- Respiratory protection, as appropriate (see Section 6.3.3).

6.3.2 Off-Plant Site Operations

Off-site activities will occur on municipal and residential property to the northwest and northeast of the BES plant. The study in this area will focus on evaluating the hydraulic properties and extent of volatile organic contamination in the aquifer through the installation of 12 monitoring wells and the sampling of these wells, 2 wells installed in the Phase II RI, and 2 Bally Municipal Wells, 2 industrial wells, and approximately 9 domestic wells in the vicinity. In addition, surveyed locations will be provided for the wells sampled, as well as other points of reference. This includes all work in residential areas that involves monitoring well installation and ground water sampling.

The level of protection selected for this work includes the following personal protective equipment:

- Coveralls or similar work clothes
- Safety shoes
- Hard hat
- Safety glasses
- Work gloves, as appropriate
- Hearing protection, as appropriate
- Respiratory protection, as appropriate.

Although no chemical contaminants are expected to be found in the residential areas, air monitoring will be performed at each well site to ensure that no contaminants are present.

6.3.3 Selection of Respiratory Protection

Information from the site history and hazard assessment indicates that the risk is low for overexposure to airborne contaminants. An air monitoring program has been established (see Chapter 7.0) to evaluate the extent of airborne contamination during the conduct of site activities. Data from the air monitoring program will be used to determine need for personal protective equipment and for safety considerations during drilling operations.

As discussed earlier, the contaminants of concern are:

CONTAMINANT	CHEMICAL ABSTRACTS REGISTRY NUMBER (CAS #)	SYNONOMS/ ABBREVIATIONS
Trichloroethylene	79-01-6	TCE
1,1,1-Trichloroethane	71-55-6	Methyl chloroform/TCA
Tetrachloroethylene	127-18-4	Perchloroethylene/PCE
1,1-Dichloroethylene	540-59-0	DCE

Air concentration standards and guidelines for each of these compounds are shown in Table 6-1.

As described in Chapter 7.0, air monitoring will be conducted using real-time quantitative instrumentation. A non-specific organic vapor analyzer (OVA) with a photoionization detector will be used to measure total vapors; indicator tubes will be used to measure airborne chlorinated compounds. If air concentrations between 10 and 15 ppm are measured which are sustained over 15 minutes, air purifying respirators (full face) with organic vapor cartridges will be worn until the air concentration drops below 10 ppm for a sustained period of time (15 minutes or longer). This concentration (10 - 15 ppm) is well below the air concentration values listed in Table 6-1.

Organic vapor air purifying respirators have been approved by the National Institute of Occupational Safety and Health (NIOSH) (NIOSH Certified Equipment List, 10/1/85) as respiratory protection against not more than 1,000 ppm organic vapors except where a lower concentration produces an Imminently Dangerous to Life and Health (IDLH) atmosphere. Only NIOSH-approved respiratory protective equipment will be used during the conduct of this investigation. If air concentrations exceed 500 ppm in the breathing zone at any time during the conduct of site activities, positive pressure or pressure demand supplied air or self-contained breathing apparatus will be provided.

7.0 MONITORING

The site activities which pose the greatest hazard for generating airborne contaminants include:

- Soil borings within suspected source areas
- Installation of the single monitoring well (87-13S) within the former degreasing area.

An air monitoring program will be implemented to ensure that proper levels of protection are employed. The site activities which pose the least hazard for generating airborne contaminants are all operations in the residential areas.

7.1 ROUTINE MONITORING

Routine air monitoring will include:

- Monitoring the breathing zone in work areas for organic vapors
- Monitoring borings for explosive conditions.

The site history and toxicity data show that TCE, TCA, PCE and DCE represent the greatest hazard for airborne organic vapors. The PELs and other guidelines for each of these chemicals were identified in Chapter 6.0.

An OVA and/or colorimetric detector tubes will be used to monitor the breathing zone and downhole at the boreholes. If downhole readings exceed 50 ppm, the borehole will be permitted to vent for 15 minutes. If the concentration has decreased, work will continue, but if the concentration has not decreased appropriate control measures will be instituted. Work will resume when conditions stabilize below 50 ppm. Respiratory protective equipment will be used if sustained (greater than 15 minutes) breathing zone concentrations between 10 and 25 ppm are encountered.

An Explosivity 102 Meter or equivalent will be used to monitor work areas for explosive conditions. During drilling and before downhole sampling, boreholes will be checked for explosive conditions. Work shall cease if Lower Explosive Limit (LEL) readings of 10 percent to 25 percent are detected and appropriate control measures (i.e., purging of borehole, etc.) will be instituted. Work will resume when the reading stabilizes below 10 percent LEL. Routine, periodic monitoring will be conducted when work begins on a different portion of the site.

7.2 ADDITIONAL PROCEDURES

In addition to the routine monitoring described above, the field health and safety officer or the Remcor corporate health and safety officer may implement other sampling methods and procedures as warranted by site conditions or activities.

The field health and safety officer or his designee is responsible for conducting all on-site monitoring, for maintenance and calibration of instruments and sampling pumps, and for reporting monitoring results to the project manager and employees. All OSHA rules and regulations, including reporting requirements, will be adhered to regarding personal monitoring.

All monitoring equipment will be maintained and calibrated according to manufacturer's specifications. Instrument maintenance and calibration records and logs will be maintained by the field health and safety officer.

8.0 INFORMATION PROGRAMS

8.1 SITE HEALTH AND SAFETY

Before beginning work at the site, each employee whose job assignment involves the potential for exposure to hazardous materials shall be fully informed of site hazards, operations, and hazard mitigation activities.

This site-specific HASP will be the primary document containing this information. The Work Plan (Remcor, September 1987b) shall be available on site for inspection by employees, their designated representatives, contractors and subcontractors, OSHA, and EPA representatives.

Pre-entry briefings shall be held prior to initiating any site activity and at such other times as necessary to ensure that employees are appraised of the HASP and that it is being followed. Inspections (audits) shall be conducted by the field health and safety officer, the project manager, or the Remcor corporate health and safety officer, as necessary to determine the effectiveness of the site health and safety program. Any deficiencies in the site HASP or the implementation of the program shall be corrected.

8.2 RECORDKEEPING

8.2.1 Site-Specific Recordkeeping

All site-specific health and safety documents, training logs, etc., shall be maintained as part of the permanent project file. The project manager has overall responsibility for all project records. The field health and safety officer, under the general direction of the corporate health and safety officer, shall have primary responsibility for site health and safety records at this site.

9.0 DECONTAMINATION

9.1 BES PLANT SITE ACTIVITIES

Decontamination facilities will be provided for equipment and for site personnel and equipment. Decontamination procedures will be conducted in the CRZ prior to the initiation of any activity in the exclusion zones, the location of the CRZ will be selected based on the following criteria:

- Discussion with management of adjacent facilities
- Availability of water supply
- Location relative to the exclusion zone (i.e., upwind, etc.)
- Minimization of exposure of uncontaminated personnel or equipment to contaminated investigative personnel or equipment.

When the CRZ has been selected, the area will be defined using hazard tape and/or a polyethylene ground cover or other appropriate measures. Only assigned and trained personnel will be allowed in the CRZ. The decontamination process will be monitored by the field health and safety officer or his/her designee.

Decontamination will begin at the area in the CRZ closest to the exclusion zone. An equipment drop area will be provided for personnel exiting the exclusion zone. Equipment, samples, and instruments will be decontaminated in the equipment drop area. Equipment or instruments that were placed in protective bags or plastic will also be placed in the equipment drop area until bags are removed. Once equipment has been decontaminated or verified as clean, it may be moved farther into the CRZ or be removed to the support zone. Following the equipment drop, personal protective equipment will be removed. Disposables (e.g., Tyvek suits, etc.) will be placed in clean polyethylene bags; other protective equipment (e.g., boots, etc.) will be decontaminated with soap/water or water rinse. Respirators will be cleaned according to manufacturers

specifications. Due to the low level of contamination and areas where exposure could occur, personnel decontamination will consist of washing hands with soap and water.

Large equipment such as drill rigs, backhoes, etc., will be spray-washed or steam-cleaned before leaving the site. All equipment must be verified as "clean" by the field health and safety officer before leaving the site. Equipment decontamination practices have been detailed in the FSAP (Remcor, September 1987a), Section 3.4.

9.2 OFF-PLANT SITE ACTIVITIES

Due to the low potential for contamination off of the plant site, no special personnel decontamination procedures are needed. Equipment decontamination procedures for the purpose of avoiding cross contamination during drilling, monitoring well installation, or ground water sampling have been detailed in the FSAP.

10.0 EMERGENCY RESPONSE PLAN

10.1 GENERAL RESPONSE CONSIDERATIONS

Emergency response must minimize the health and safety risk of site personnel. Site activities will be conducted in groups of at least two workers ("Buddy System") to provide continuous monitoring in the event an emergency occurs. Due to the low levels of ground water contamination, worker exposure to levels approaching the PEL is considered a very remote possibility, especially for the off-plant site activities. The physical hazards associated with working in an active manufacturing facility and drilling activities in general pose the greatest potential for worker injury.

10.2 RESPONSIBILITIES

10.2.1 Health and Safety Officer

Remcor's projector director, Mr. Leo M. Brausch, is ultimately responsible for all project activities, including adherence to and implementation of this HASP. Ms. Linda K. Scholl, Remcor's corporate health and safety officer provides support to the project staff, including development of the site plan and monitoring compliance with the site plan. Site health and safety will be under the direction of a site health and safety officer designated by Ms. Scholl, in consultation with the project director and project manager/coordinator. The site health and safety officer will generally be the lead technical investigator on site.

The site health and safety officer or designee on site shall have responsibility for directing response activities in the event of an emergency. Responsibilities are as follows:

- Assess situation
- Determine required response measures
- Notify appropriate response teams

- Determine and direct on-site personnel actions during the emergency
- Contact and coordinate with government agencies.

10.2.2 Public Response Agencies

Following is a list of public response agencies which may be contacted dependent on the nature of the situation. They may assume authority for emergency response. In the event that this occurs, BES personnel shall assist the agency in charge.

Agency	Telephone No.
Police	215-373-2500
Fire Department	215-845-7200
Bally Medical Center	215-845-7200 or 215-367-2575

Agency	Telephone No.
Poison Control Center	215-375-9115
Berks County Emergency Management Agency	215-374-4800
Pottstown Memorial Medical Center	215-327-7000 or 215-327-7100

10.3 ACCIDENTS AND NONROUTINE EVENTS

The types of emergencies outlined below are not all-inclusive and the corresponding response procedures should not be considered inflexible. Every accident presents a unique event that must be dealt with by trained personnel working in a calm, controlled manner. In the event of an accident/unusual event, the prime consideration is to provide the appropriate initial response to assist those in jeopardy without placing additional personnel at unnecessary risk.

10.3.1 Worker Injury

Emergencies will be reported by the field health and safety officer to one of the following individuals at the BES plant, in the order listed:

- William Goodin, Director of Employee Relations
- Edward Treffinger, Director of Manufacturing
- Mary Ann Reinhart, Secretary
- Stanley Miller.

The field health and safety officer will provide a report to BES personnel and the corporate health and safety officer including the following:

- A description of the emergency (including date, time, and duration)
- Date, time, and names of all persons/agencies notified and their responses
- A description of corrective actions implemented or other resolution of the incident.

All workers on site are responsible to conduct themselves in a mature, calm manner. All personnel must conduct themselves to avoid exposure to themselves and to surrounding personnel and/or the public. Depending on the severity of the injury, emergency medical response may be sought from the local hospital. If the person can be moved, they will be taken to the edge of the work area (on a stretcher, if needed) where contaminated clothing will be removed (if possible), and emergency first aid administered while awaiting transportation by a local emergency medical service.

A written report detailing the accident, its causes, and consequences shall be submitted to Mr. William Goodin of BES and the Remcor corporate health and safety officer within three working days of the accident.

If the injury to the worker is chemical in nature (e.g., overexposure), the following first aid procedures are generally to be instituted as soon as possible:

- Eye Exposure - If contaminated solid or liquid gets into the eyes, they will be washed immediately at the emergency eyewash station or with a portable eyewash bottle using large amounts of water and lifting the lower and upper lids occasionally. Medical attention will be obtained immediately. (Use of contact lenses is not permitted in the designated contamination areas.)

- Skin Exposure - If contaminated solid or liquid gets on the skin, the affected area will be promptly washed with soap or mild detergent and water. If contaminated solids or liquids penetrate the clothing, clothing will be immediately removed and the skin washed with soap or mild detergent and water. Medical attention will be obtained if symptoms warrant.

- Inhalation - If a person inhales a large volume of potentially toxic organic vapor, they will be moved to fresh air at once. If breathing has stopped, artificial respiration will be performed. The affected person will be kept warm and at rest. Medical attention will be obtained immediately.

- Ingestion - If contaminated solid or liquid is swallowed, medical attention will obtained immediately.

10.3.2 Fires

Site personnel will be trained in fire-suppression techniques. They shall be instructed in the following:

- Proper use of the fire extinguisher supplied on site.

- Respiratory protective equipment that is required in the near vicinity of a fire.

- Techniques for smothering fires using available noncombustible materials.

- Emergency evacuation procedures in the event fires reach an out-of-control situation.

In general, all personnel will be instructed to summon the local fire department for assistance for any fire for which the response time of

the fire department is less than the anticipated time required to extinguish the fire.

10.3.2.1 Small Fires

In the event of a small fire at the site, the field health and safety officer shall take the following minimum actions:

- Evacuate all unnecessary personnel from the area, if possible, to an upwind location
- Attempt to extinguish fire using portable fire extinguishers or by smothering (PPE may be required).

Request emergency response assistance (ambulance, fire, hospital poison control center) as appropriate for any injuries or exposures to hazardous chemicals which occur during suppression of the fire.

10.3.2.2 Large Fires

In the event of a large fire, or small fire which cannot be extinguished, the field health and safety officer will undertake the following actions:

- Evacuate all personnel from the area, preferably to an upwind location.
- Notify the local fire department and other emergency agencies.

10.4 EMERGENCY RESPONSE EQUIPMENT

Before initiating RI activities, the following emergency equipment will be provided at the site and will be inspected by the field health and safety officer:

- First-aid kit
- Portable eyewash stations
- At least one chemical fire extinguisher (Type ABC) will be provided on site. They shall be maintained in the active work areas as directed by the field health and safety officer.

- List of persons and phone numbers for emergency notification.

10.5 EMPLOYEE TRAINING

All site employees, including subcontractor personnel, shall be thoroughly trained in the elements of Emergency Response. Emergency Response Training shall include the following, with appropriate references to sections of this HSAP:

- Personnel roles, lines of authority, and communication (Section 10.1 and 10.2)
- Emergency recognition and prevention (Section 10.3)
- Safe distances and places of refuge (to be determined for each sampling location on site)
- Site security and control (Sections 10.1 and 10.2)
- Decontamination (Section 10.3)
- Emergency medical treatment and first aid (Section 10.3)
- Emergency alerting and response procedures (Sections 10.1 and 10.2).

The Emergency Response Plan will be reviewed periodically by the field health and safety officer and the project manager. It will be amended as necessary to keep it current with new or changing site conditions or information.

11.0 GENERAL SITE OPERATIONS

The job tasks described in Chapter 2.0, Section 2.3, and in the RI/FS Work Plan, Chapter 4.0 (Remcor, September 1987b) include the following:

- Task 3- Baseline Ground Water Study (Boro of Bally)

  - Monitor well installation
  - Ground water sampling
  - Geophysical survey

- Task 4 - Source Delineation (BES Property)

  - Shallow soil sampling
  - Monitoring well installation and sampling

- Task 5 - Hydrogeologic Investigation

  - Core drilling and geophysical borehole logging
  - Well installation and sampling
  - Surface water sampling
  - Aquifer performance testing.

These activities pose potential hazards from exposure to toxic substances; performance of specific tasks themselves may present unique hazards. The job tasks to be performed off of the plant site pose very little potential hazard from exposure to toxic substances; of primary concern in these areas will be conduct of drilling operations in proximity to residential development. Remcor is committed to the protection of its employees from chemical hazards and from specific job hazards associated with well installation and equipment operation. For specific job tasks, these two elements may have conflicting requirements. The safe operation of equipment and tools necessary for well installation may be impeded by PPE which limits visibility, range of motion, communications, and manual dexterity. The field health and safety officer, with guidance from the remcor corporate health and safety officer, will address each job task to determine the optimum balance between safe work practices and use of PPE without adding additional safety hazards.

Further, the site-specific HASP may be modified and/or amended during the course of site investigation in order to maintain this optimum balance.

In addition, Remcor is committed to comply with all applicable OSHA regulations regarding construction safety as promulgated in 29 CFR Part 1926 and in the December 1986 Interim Final Rule, 29 CFR part 1910.120. The following sections highlight selected construction safety requirements. These highlights are not all-inclusive, and the corporate health and safety officer shall be responsible for review and application of any additional requirements.

11.1 ILLUMINATION

When feasible, all work at the site will be scheduled for daylight hours. Also, except for some inside borings, site operations will be conducted out-of-doors. The following illumination requirements apply to site operations while work is in progress:

MINIMUM ILLUMINATION INTENSITIES

Foot-Candles	Area or Operations
5	General site areas
3	Excavation and work areas, accessways, active storage areas
5	Indoors
10	General shops, including storerooms, locker rooms, eating areas, and restrooms
30	First-aid stations, infirmaries, offices

11.2 SANITATION

11.2.1 Water Supply

Potable water will be provided on site by BES or in portable containers capable of being tightly closed. Containers used for drinking water

will be clearly marked and not used for any other purpose. Any outlets for nonpotable water, such as water for industrial or firefighting purposes, will be clearly identified by BES personnel as unsuitable for drinking or washing. There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing nonpotable water.

11.2.2 Toilet Facilities

Transportation will be provided for field employees to use toilet facilities at the BES plant.

11.2.3 Food Handling

No food shall be prepared, handled, or eaten in active work areas. Meals will be eaten off site after proper personnel decontamination procedures have been completed.

11.2.4 Washing Facilities

Adequate washing facilities will be provided for field decontamination.

11.3 CONTRACTORS AND SUBCONTRACTORS

All Remcor-employed contractors and subcontractors engaged in site activities will be given a copy of this HSAP and will be required to comply with all applicable Remcor and OSHA standards and regulations. Remcor will thoroughly brief subcontract employees on the nature of known site hazards.

REFERENCES

LIST OF REFERENCES

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National Institute of Occupational Safety and Health (NIOSH), October 1, 1985, NIOSH Certified Equipment List as of October 1, 1985, U.S. Department of Health and Human Services, Public Health Services, Center for Disease Control, National Institute for Occupational Safety and Health.

Remcor, September 1987a, Field Sampling and Analysis Plan - Bally Engineered Structures Site, Bally, Pennsylvania, Remcor, Inc., Pittsburgh, Pennsylvania.

Remcor, September 1987b, Remedial Investigation/Feasibility Study Work Plan - Bally Engineered Structures Site, Bally, Pennsylvania, Remcor, Inc., Pittsburgh, Pennsylvania.

U.S. Environmental Protection Agency (EPA), Environmental Photographic Interpretation Center (EPIC), August 1986, Site Analysis - Bally Case and Cooler, Bally, Pennsylvania, Environmental Monitoring Systems Laboratory, Las Vegas, Neveda.

TABLE

TABLE 6-1

AIR CONCENTRATION STANDARDS AND GUIDELINES
FOR SITE CONTAMINANT
BALLY ENGINEERED STRUCTURES SITE RI/FS

COMPOUND	OSHA STANDARD(S)	NIOSH GUIDELINE(S)	ACGIH GUIDELINE(S)
TCE	100 ppm PEL 200 ppm C	300 ppm 5 min/2 hr peak 25 ppm 10 hr TWA	50 ppm 8 hr TLV-TWA 200 ppm TLV-STEL
TCA	350 ppm PEL	350 15 min. C 1,000 ppm IDLH	350 ppm TLV-TWA 450 ppm TLV-STEL
PCE	100 ppm PEL 200 ppm C	300 ppm 5 min/3 hr peak	50 ppm TLV-TWA 200 ppm TLV-STEL
DCE	200 ppm PEL	4,000 ppm IDLH	200 ppm TLV-TWA 250 ppm TLV-STEL

NOTES:

NIOSH: National Institute of Occupational Safety and Health.

ACGIH: American Conference of Governmental Industrial Hygenists.

ppm: Parts per million in air.

PEL: Permissible Exposure Limit - concentration not to be exceeded averaged over an eight-hour work period.

C: Ceiling Limit: concentration not to be exceeded at any time during the work period regardless of the eight-hour average concentration.

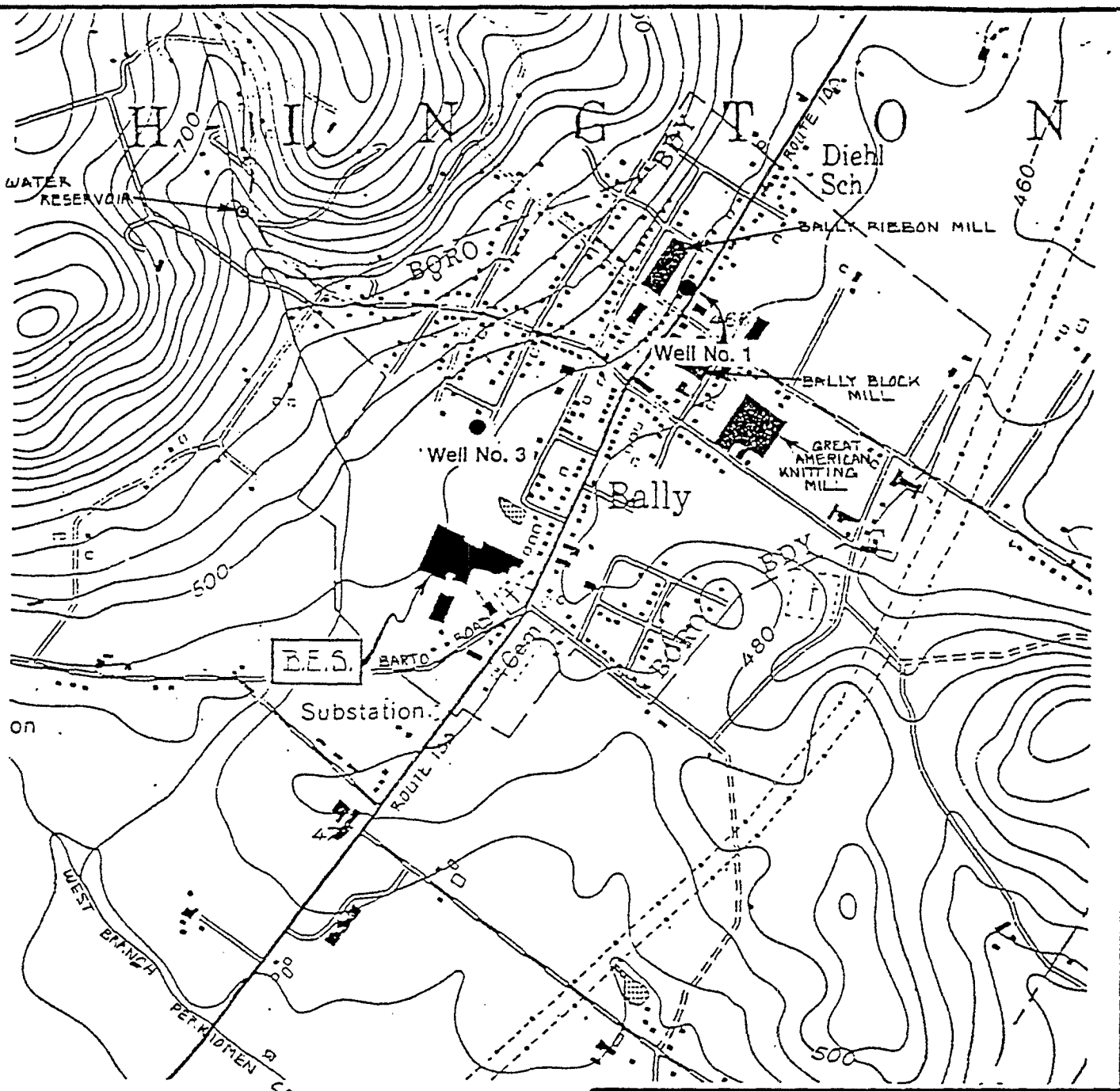
TWA: Time-weighted average - air concentration averaged over a given period of time, usually eight hours unless otherwise noted.

TLV-TWA: Threshold Limit Value - Time Weighted Average - the time weighted average concentration for a normal 8-hour work day and a 40-hour work week, to which nearly all workers may be repeatedly exposed without adverse affect.

TLV-STEL: Threshold Limit Value- Short Term Exposure Limit - the concentration to which a worker may be exposed for short period of time without adverse affect provided the TLV-TWA is not exceeded. The STEL is a 15 minute-time weighted average that should not be exceeded at any time during a work day.

IDLH: Immediately Dangerous to Life and Health - air concentration capable of causing death or irreversible damage after even a short exposure.

FIGURES



REFERENCE:

U.S.G.S. TOPOGRAPHIC QUADRANGLE EAST GREENVILLE, PENNSYLVANIA.

LEGEND:

● WELL NO. 1 – DENOTES BOROUGH OF BALLY MUNICIPAL WELL

FIGURE 1-1

SITE LOCATION MAP

PREPARED FOR

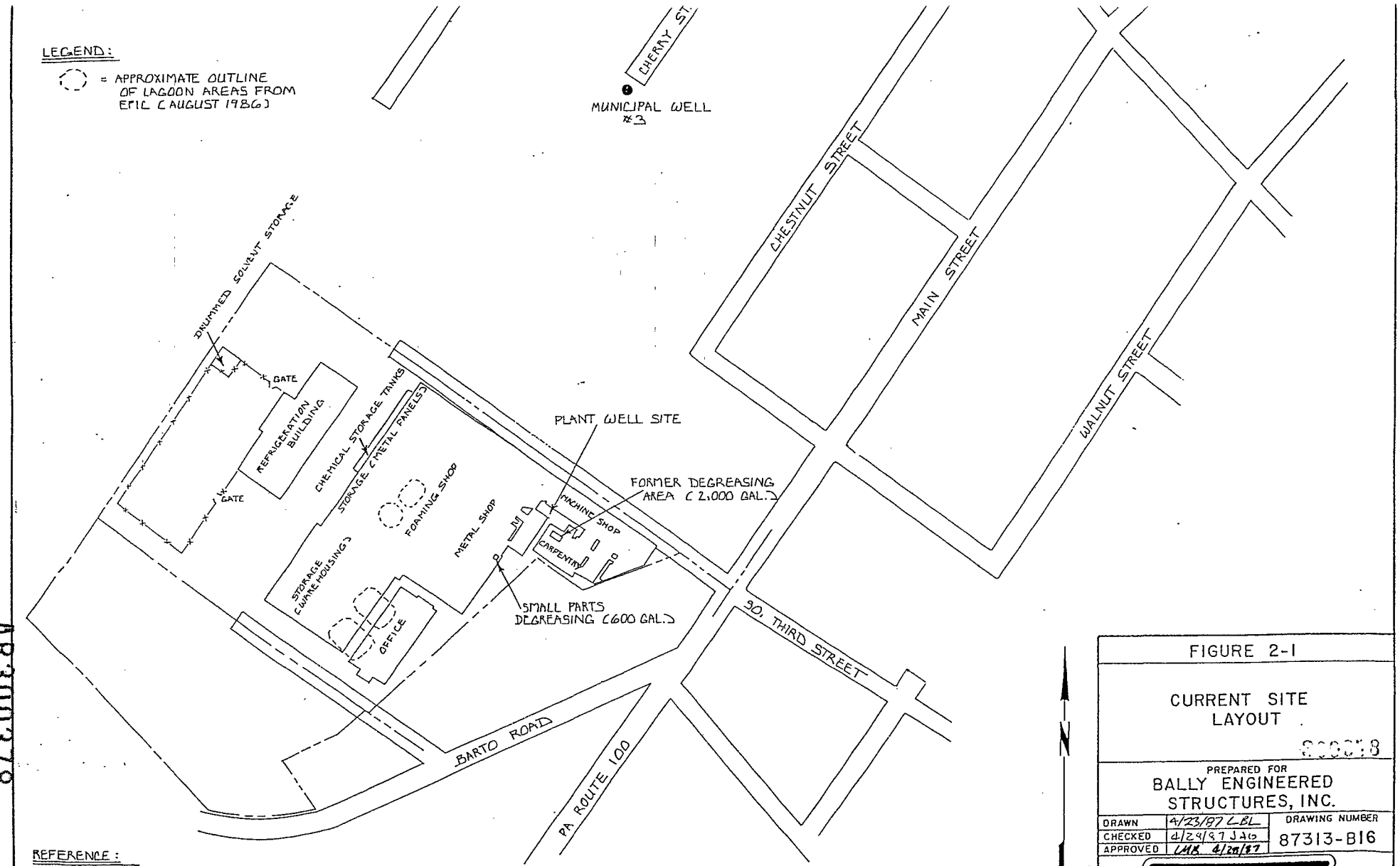
BALLY ENGINEERED STRUCTURES, INC.

DRAWN	4/14/87 LBL	DRAWING NUMBER
CHECKED	4/16/87 JAG	87313-A5
APPROVED	MB 4/28/87	

REMCOR

AR300377

128579



REFERENCE:

PLANT DETAIL FROM B.E.S. DWG. NO. C-78-196, DATED 3-8-78.

FIGURE 2-1

CURRENT SITE LAYOUT

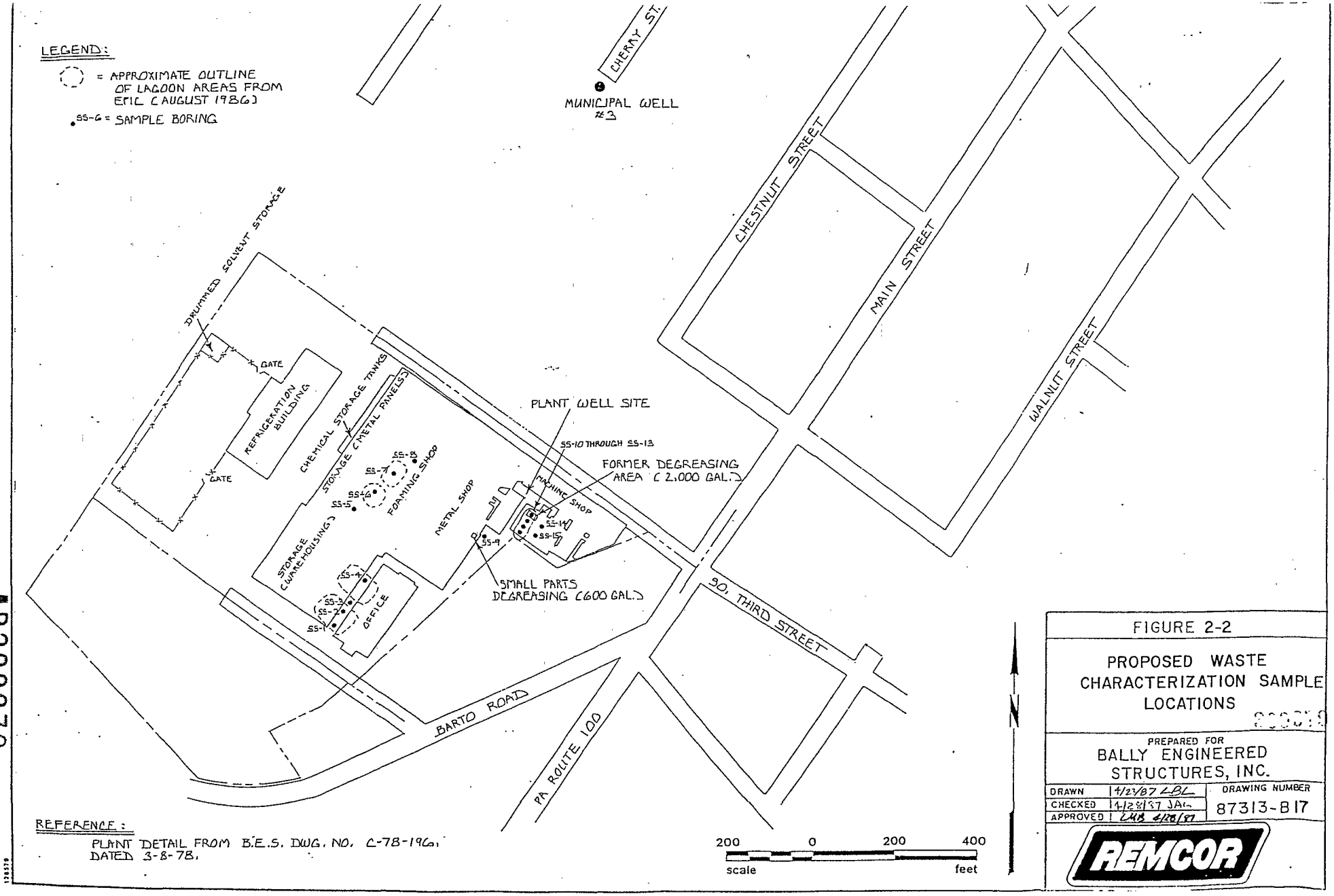
PREPARED FOR
BALLY ENGINEERED STRUCTURES, INC.

DRAWN	4/23/97 CBL	DRAWING NUMBER
CHECKED	4/29/97 JAG	87313-B16
APPROVED	LMK 4/28/97	

REMCOR

AR300378

120579



REFERENCE:

PLANT DETAIL FROM B.E.S. DWG. NO. C-78-196, DATED 3-8-78.

FIGURE 2-2

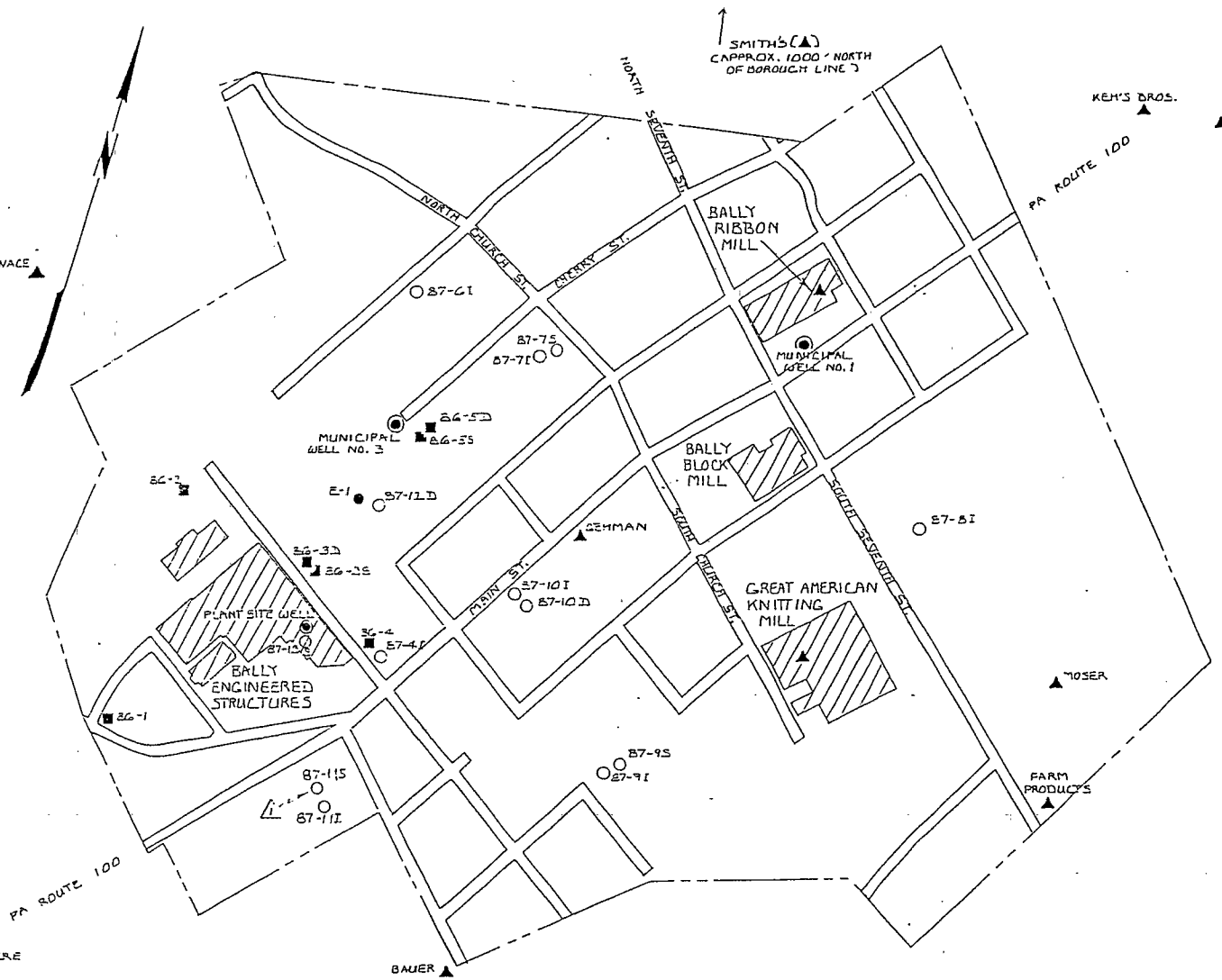
PROPOSED WASTE CHARACTERIZATION SAMPLE LOCATIONS

PREPARED FOR
BALLY ENGINEERED STRUCTURES, INC.

DRAWN	4/23/87 LBL	DRAWING NUMBER
CHECKED	4/28/87 JAC	87313-B17
APPROVED	LMB 4/28/87	

REMCOR

AR300379



LEGEND:

- 86-2 ■ = ERM MONITORING WELL
- NACE ▲ = OFF-SITE WELL LOCATION
- ——— BOROUGH LINE
- ○ 87-10 PROPOSED MONITORING WELL
  - S = SHALLOW
  - I = INTERMEDIATE
  - D = DEEP
- ● E-1 EXPLORATION CORE HOLE

NOTE:

ERM WELL NOMENCLATURE DOES NOT CORRELATE EXACTLY WITH THAT OF THE PROPOSED WELLS. ERM WELLS 86-1, 86-2, 86-3S, 86-4 AND 86-5S ARE SHALLOW WELLS UNDER THE PROPOSED SYSTEM, WHILE 86-3D AND 86-5D APPROXIMATE INTERMEDIATE DEPTH WELLS.

500 0 500 1000
scale feet

REFERENCE:

SAMPLE LOCATIONS FROM ERM PHASE II REPORT (FUNK AND SMITH, OCT. 27, 1986).
BASE MAP FROM TOPOGRAPHICAL SURVEY, BOROUGH OF BALLY (1975).

FIGURE 2-3

PROPOSED BORING AND MONITORING WELL LOCATIONS

PREPARED FOR
BALLY ENGINEERED STRUCTURES, INC.

DRAWN	4/23/87 LBL	DRAWING NUMBER
CHECKED	4/28/87 JAG	87313-B18
APPROVED	LHB 4/28/87	

REMCOR REV. 1

REVS. 1 ○ 87-11S & 87-11I ADDED RJH 7/15/87

AR300380

APPENDIX A

TOXICITY PROFILES

TRICHLOROETHYLENE

Summary

Trichloroethylene (TCE) induced hepatocellular carcinomas in mice and was mutagenic when tested using several microbial assay systems. Chronic inhalation exposure to high concentrations caused liver, kidney, and neural damage and dermatological reactions in animals.

CAS Number: 79-01-6

Chemical Formula: C_2HCl_3

IUPAC Name: Trichloroethene

Important Synonyms and Trade Names: Trichloroethene, TCE, and ethylene trichloride

Chemical and Physical Properties

Molecular Weight: 131.5

Boiling Point: 87°C

Melting Point: -73°C

Specific Gravity: 1.4642 at 20°C

Solubility in Water: 1,000 mg/liter

Solubility in Organics: Soluble in alcohol, ether, acetone, and chloroform

Log Octanol/Water Partition Coefficient: 2.29

Vapor Pressure: 60 mm Hg at 20°C

Vapor Density: 4.53

Transport and Fate

TCE rapidly volatilizes into the atmosphere where it reacts with hydroxyl radicals to produce hydrochloric acid, carbon monoxide, carbon dioxide, and carboxylic acid. This is probably the most important transport and fate process for trichloroethylene in surface water and in the upper layer of soil. TCE adsorbs to organic materials and can be bioaccumulated to some degree. However, it is unclear whether trichloroethylene bound to organic material can be degraded by microorganisms or must be desorbed to be destroyed. There is some evidence

that higher organisms can metabolize TCE. TCE leaches into the ground water fairly readily, and it is a common contaminant of ground water around hazardous waste sites.

Health Effects

TCE is carcinogenic to mice after oral administration, producing hepatocellular carcinomas (NCI 1976, NTP 1982). It was found to be mutagenic using several microbial assay systems. TCE does not appear to cause reproductive toxicity or teratogenicity. TCE has been shown to cause renal toxicity, hepatotoxicity, neurotoxicity, and dermatological reactions in animals following chronic exposure to levels greater than 2,000 mg/m^3 for six months. TCE has low acute toxicity; the acute oral LD_{50} value in several species ranged from 6,000 to 7,000 mg/kg.

Toxicity to Wildlife and Domestic Animals

There was only limited data on the toxicity of TCE to aquatic organisms. The acute toxicity to freshwater species was similar in the three species tested, with LC_{50} values of about 50 mg/liter. No LC_{50} values were available for saltwater species. However, a dose of two mg/liter caused erratic swimming and loss of equilibrium in the grass shrimp. No chronic toxicity tests were reported.

No information on the toxicity of TCE to domestic animals or terrestrial wildlife was available in the literature reviewed.

Regulations and Standards

Ambient Water Quality Criteria (USEPA):

Aquatic Toxicity

The available data are not adequate for establishing criteria. However, EPA did report the lowest values known to be toxic in aquatic organisms.

Freshwater

Acute toxicity: 45 mg/liter
Chronic toxicity: No available data

Saltwater

Acute toxicity: 2 mg/liter
Chronic toxicity: No available data

Human Health

Estimates of the carcinogenic risks associated with lifetime exposures to various concentrations of TCE in water are:

Risk	Concentration
10^{-5}	27 µg/liter
10^{-6}	2.7 µg/liter
10^{-7}	0.27 µg/liter

CAG Unit Risk (USEPA): 1.1×10^{-2} $(mg/kg/day)^{-1}$

NISOH Recommended Standards (air): 540 mg/m^3 TWA
760 mg/m^3 10-min Ceiling Level

OSHA Standards (air): 540 mg/m^3 TWA
1,075 mg/m^3/15-min Ceiling Level
1,620 mg/m^3 for 5 min every 3 hr, Peak Concentration

References

International Agency for Research on Cancer (IARC), 1979, "IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans," Vol. 20, Some Halogenated Hydrocarbons, World Health Organization, Lyon, France, pp. 545-572.

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1,1,1-TRICHLOROETHANE

Summary

Preliminary results suggest that 1,1,1-trichloroethane (1,1,1-TCA) induces liver tumors in female mice. It was shown to be mutagenic using the Ames assay, and it causes transformation in cultured rat embryo cells. Inhalation exposure to high concentrations of 1,1,1-TCA depressed the central nervous system; affected cardiovascular function; and damaged the lungs, liver, and kidneys in animals and humans. Irritation of the skin and mucous membranes has also been associated with human exposure to 1,1,1-TCA.

CAS Number: 71-55-6

Chemical Formula: CH_3CCl_3

IUPAC Name: 1,1,1-Trichloroethane

Important Synonyms and Trade Names: Methyl chloroform, chloro-1,1,1-TCA

Chemical and Physical Properties

Molecular Weight: 133.4

Boiling Point: 74.1°C

Melting Point: -30.4°C

Specific Gravity: 1.34 at 20°C (liquid)

Solubility in Water: 480-4,400 mg/liter at 20°C (several divergent values were reported in the literature)

Solubility in Organics: Soluble in acetone, benzene, carbon tetrachloride, methanol, ether, alcohol, and chlorinated solvents

Log Octanol/Water Partition Coefficient: 2.17

Vapor Pressure: 123 mm Hg at 20°C

Vapor Density: 4.63

Transport and Fate

1,1,1-TCA disperses from surface water primarily by volatilization. Several studies have indicated that 1,1,1-TCA may be adsorbed onto organic materials in the sediment, but this is probably not an important

route of elimination from surface water. 1,1,1-TCA can be transported in the ground water, but the speed of transport depends on the composition of the soil.

Photo-oxidation by reaction with hydroxyl radicals in the atmosphere is probably the principal fate process for this chemical.

Health Effects

1,1,1-TCA was retested for carcinogenicity because in a previous study by NCI (1977), early lethality precluded assessment of carcinogenicity. Preliminary results indicate that 1,1,1-TCA increased the incidence of combined hepatocellular carcinomas and adenomas in female mice when administered by gavage (NTP 1984). There is evidence that 1,1,1-TCA is mutagenic in Salmonella typhimurium and causes transformation in cultured rat embryo cells (USEPA 1980). These data suggest that the chemical may be carcinogenic.

Other toxic effects of 1,1,1-TCA are seen only at concentrations well above those likely in an open environment. The most notable toxic effects of 1,1,1-TCA in humans and animals are central nervous system depression, including anesthesia at very high concentrations and impairment of coordination,equilibrium, and judgement at lower concentrations (350 ppm and above); cardiovascular effects, including premature ventricular contractions, decreased blood pressure, and sensitization to epinephrine-induced arrhythmia; and adverse effects on the lungs, liver, and kidneys. Irritation of the skin and mucous membranes resulting from exposure to 1,1,1-TCA has also been reported. The oral LD_{50} value of 1,1,1-TCA in rates is about 11,000 mg/kg.

Toxicity to Wildlife and Domestic Animals

The acute toxicity of 1,1,1-TCA to aquatic species is rather low, with the LC_{50} concentration for the most sensitive species tested being 52.8 mg/l. No chronic toxicity studies have been done on 1,1,1-TCA, but acute-chronic ratios for the other chlorinated ethanes ranged from 2.8

to 8.7. 1,1,1-TCA was only slightly bioaccumulated with a steady-state bioconcentration factor of nine and an elimination half-life of two days.

No information on the toxicity of 1,1,1-TCA to terrestrial wildlife or domestic animals was available in the literature reviewed.

Regulations and Standards

Ambient Water Quality Criteria (USEPA):

Aquatic Life

The available data are not adequate for establishing criteria. However, EPA did report, the lowest values of the two trichloethanes (1,1,1 and 1,1,2) known to be toxic in aquatic organisms.

Freshwater

Acute toxicity: 18 mg/liter
Chronic toxicity: 8.4 mg/liter

Saltwater

Acute toxicity: 31.2 mg/liter
Chronic toxicity: No available data

Human Health

Criterion: 18.4 mg/liter

NIOSH Recommended Standard: 350 ppm (1.910 mg/m^3)/15 min Ceiling Level

OSHA Standard: 350 ppm (1,910 mg/m^3) TWA

REFERENCES

International Agency for Research on Cancer (IARC), 1979, "IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans," Vol. 20, Some Halogenated Hydrocarbons, World Health Organization, Lyon, France, pp. 545-572.

National Cancer Institute (NCI), 1976, "Bioassay of Trichloroethane for Possible Carcinogenicity," CAS No. 79-01-6, NCI, NCI Carcinogenesis Technical Report Series No. 2, Washington, D.C., DHEW Publication No. (NIH) 76-802.

National Institute for Occupational Safety and Health, 1976, "Criteria for a Recommended Standard--Occupational Exposure to 1,1,1-Trichloroethane (Methyle Chloroform)," Washington, D.C., DHEW Publication No. (NIOSH) 76.

National Institute for Occupational Safety and Health, 1983, "Registry of Toxic Effects of Chemical Subs Data Base, Washington, D.C.

National Toxicology Program (NTP), 1984, "Annual Plan Fiscal Year 1984," Research Triangle Park N.C. Public Health Service, NTP-84-023.

U.S. Environmental Protection Agency (USEPA), 1979, "Related Environmental Fate of 129 Priority Pollutants, Washington, D.C., EPA 440/4-79-029.

U.S. Environmental Protection Agency (USEPA), 1980, "Water Quality Criteria for Chlorinated Ethanes," Water Regulations and Standards, Criteria and Division, Washington, D.C., EPA 44

U.S. Environmental Protection Agency (USEPA), 1984, " Effects Assessment for 1,1,1-Trichloroethane," En Criteria and Assessment Office, Cincinnati, Ohio, ECAP-CIN-H005 (Final Draft).

Verschueren, K., 1977, "Handbook of Environmental Data Chemicals," Van Nostrand Reinhold Co., New York.

Weast, R. E., ed. 1981, "Handbook of Chemistry and Phy ," 62nd ed., CRC Press, Cleveland, Ohio, 2,332 pages.

TETRACHLOROETHYLENE

Summary

Tetrachloroethylene (PCE, perchloroethylene) induced liver tumors when administered orally to mice and was found to be mutagenic using a microbial assay system. Reproduction toxicity was observed in pregnant rats and mice exposed to high concentrations. Animals exposed by inhalation PCE exhibited liver, kidney, and central nervous system damage.

CAS Number: 127-18-4
Chemical Formula: C_2Cl_4
IUPAC Name: Tetrachloroethene
Important Synonyms and Trade Names: Perchloroethylene, PCE

Chemical and Physical Properties

Molecular Weight: 165.83
Boiling Point: 121°C
Melting Point: -22.7°C
Specific Gravity: 1.63
Solubility in Water: 150 to 200 mg/liter at 20°C
Solubility in Organics: Soluble in alcohol, ether, and benzene
Log Octanol/Water Partition Coefficient: 2.88
Vapor Pressure: 14 mm Hg at 20°C

Transport and Fate

PCE rapidly volatilizes into the atmosphere where it reacts with hydroxyl radicals to produce HCl, CO, and CO_2 and carboxylic acid. This is probably the most important transport and fate process for PCE in the environment. PCE will leach into the ground water, especially in soils of low organic content. In soils with high levels of organics, PCE adsorbs to these materials and can be bioaccumulated to some degree. However, it is unclear if PCE bound to organic material can be degraded by microorganisms or must be

desorbed to be destroyed. There is some evidence that higher organisms can metabolize PCE.

Health Effects

PCE was found to produce liver cancer in male and female mice when administered orally by gavage (NCI 1977). Unpublished gavage studies in rats and mice performed by the National Toxicological Program (NTP) showed hepatocellular carcinomas in mice and a slight, statistically insignificant increase in a rare type of kidney tumor[1]. NTP is also conducting an inhalation carcinogenicity study. Elevated mutagenic activity was found in Salmonella strains treated with PCE. Delayed ossification of skull bones and sternebrae were reported in offspring of pregnant mice exposed to 2,000 mg/m^3 of PCE for seven hours/day on days 6-15 of gestation. Increased fetal resorptions were observed after exposure of pregnant rats to PCE. Renal toxicity and hepatoxicity have been noted following chronic inhalation exposure of rats to PCE levels of 1,356 mg/m^3. During the first two weeks of subchronic inhalation study, exposure to concentrations of 1,622 ppm (10,867 mg/m^3) of PCE produced signs of central nervous system depression, and cholinergic stimulation was observed among rabbits, monkeys, rats, and guinea pigs.

Toxicity to Wildlife and Domestic Animals

PCE is the most toxic of the chloroethylenes to aquatic organisms but is only moderately toxic relative to other types of compounds. The limited acute toxicity data indicate that the LC_{50} value for saltwater and freshwater species are similar, around 10,000 µg/liter; the trout was the most sensitive (LC_{50} = 4,800 µg/liter). Chronic values were 840 and 450 µg/liter for freshwater and saltwater species, respectively, and an acute-chronic ratio of 19 was calculated.

[1] J. Mennear, NTP Chemical Manager; personal communication, 1984.

No information on the toxicity of PCE to terrestrial wildlife or domestic animals was available in the literature reviewed.

Regulations and Standard

Ambient Water Quality Criteria (USEPA):

Aquatic Life

The available data are not adequate for establishing criteria. However, EPA did report the lowest values known to be toxic to aquatic organisms.

Freshwater

Acute toxicity: 5,280 µg/liter
Chronic toxicity: 840 µg/liter

Saltwater

Acute toxicity: 10,200 µg/liter
Chronic toxicity: 450 µg/liter

Human Health

Estimates of the carcinogenic risks associated with lifetime exposure to various concentrations of PCE in water are:

Risk	Concentration
10^{-5}	8.0 µg/liter
10^{-6}	0.8 µg/liter
10^{-7}	0.08 µg/liter

CAG Unit Risk (USEPA): 5.1×10^{2} $(mg/kg/day)^{-1}$

NISOH Recommended Standards (air): 335 mg/m^3 TWA
670 mg/m^3 15-min Ceiling Level

OSHA Standards (air): 670 mg/m^3 TWA
1,340 mg/m^3 Ceiling Level
2,010 mg/m^3 for 5 min every 3 hr, Peak Level

REFERENCES

National Academy of Science (NAS), 1977, "Drinking Water and Health,", Safe Drinking Water Committee, Washington, D.C.

National Cancer Institute (NCI), 1976, "Bioassay of Tetrachloroethylene for Possible Carcinogenicity," CAS No. 79-01-6, NCI, NCI Carcinogenesis Technical Report Series No. 2, Washington, D.C., DHEW Publication No. (NIH) 77-813.

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U.S. Environmental Protection Agency (USEPA), 1980, "Water Quality Criteria for Tetrachloroethylene," Office of Water Regulations and Standards, Criteria and Division, Washington, D.C., EPA 440/

U.S. Environmental Protection Agency (USEPA), 1984, " Effects Assessment for Tetrachloroethylene," Final Environmental Criteria and Assessment Office, Cincinnati, Ohio, ECAP-CIN-H009.

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Verschueren, K., 1977, "Handbook of Environmental Data Chemicals," Van Nostrand Reinhold Co., New York.

Weast, R. E., ed. 1981, "Handbook of Chemistry and Physics ," 62nd ed., CRC Press, Cleveland, Ohio, 2,332 pages.

1,1-DICHLOROETHYLENE

Summary

1,1-Dichloroethylene (VDC, vinylidene chloride) caused kidney tumors (in males only) and leukemia in one study of mice exposed by inhalation, but the results of other studies were equivocal or negative. 1,1-Dichloroethylene is mutagenic, and it caused adverse reproductive effects when administered to rats and rabbits by inhalation. Chronic exposure causes liver damage, and acute exposure to high doses produces nervous system damage.

CAS Number: 75-35-4

Chemical Formula: CH_2CCl_2

IUPAC Name: 1,1-Dichloroethene

Important Synonyms and Trade Names: Vinylidene chloride, VDC, 1,1-dichloroethene, 1,1-DCE

Chemical and Physical Properties

Atomic Weight: 96.94

Boiling Point: 37°C

Melting Point: -122.1°C

Specific Gravity: 1.218 at 20°C

Solubility in Water: 400 mg/liter at 20°C

Solubility in Organics: Sparingly soluble in alcohol, ether, acetone, benzene, and chloroform

Log Octanol/Water Partition Coefficient: 1.48

Vapor Pressure: 500 mmHg at 20°C

Vapor Density: 3.25

Transport and Fate

Volatilization appears to be the primary transport process for 1,1-Dichloroethylene (VDC), and its subsequent photooxidation in the atmosphere by reaction with hydroxyl radicals is apparently the predominant fate process. Information on other transport and fate mechanisms was generally lacking for 1,1-dichloroethylene. However, by inference from

related compounds, hydrolysis, sorption, bioaccumulation, biotransformation, and biodegradation probably all occur but at rates too slow to be of much significance.

Health Effects

1,1-Dichloroethylene caused kidney tumors in males and leukemia in males and females in one study of mice exposed by inhalation, gave equivocal results in other inhalation studies, and gave negative results in rats and mice following oral exposure and in hamsters following inhalation exposure. VDC was mutagenic in several bacterial assays. 1,1-Dichloroethylene did not appear to be teratogenic but did cause embryotoxicity and fetoxicity when administered to rats and rabbits by inhalation. Chronic exposure to oral doses of VDC as low as 5 mg/kg/day caused liver changes in rats. Acute exposure to high doses causes central nervous system depression, but neurotoxicity has not been associated with low-level chronic exposure. The oral LD_{50} value for the rat is 1,500 mg/kg, and for the mouse it is 200 mg/kg.

Toxicity to Wildlife and Domestic Animals

1,1-Dichloroethylene is not very toxic to freshwater or saltwater species, with acute LC_{50} values generally ranging from 80 to 200 mg/liter. A chronic study in which no adverse effects were observed indicated that the acute-chronic ratio was less than 40; a 13-day study that produced an LC_{50} of 29 mg/liter indicated that the acute-chronic ratio is greater than 4.

No reports of the toxicity of 1,1-dichloroethylene to terrestrial wildlife or domestic animals were found in the literature reviewed.

Regulations and Standards

Ambient Water Quality (USEPA):

Aquatic Life

The available data are inadequate for establishing criteria. However, EPA did report the lowest values known to cause toxicity in aquatic organisms.

Freshwater

Acute toxicity:	11,600 µg/liter
Chronic toxicity:	No available data

Saltwater

Acute toxicity:	224,000 µg/liter
Chronic toxicity:	No available data

Human Health

Estimates of the carcinogenic risks associated with lifetime exposure to various concentrations of 1,1-dichloroethlene in water are:

Risk	Concentration
10^{-5}	0.33 µg/liter
10^{-6}	0.333 µg/liter
10^{-7}	0.0033 µg/liter

CAG Unit Risk (USEPA): 1.16 $(mg/kg/day)^{-1}$

References

International Agency for Research on Cancer (IARC), 1987, "IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans, Vol. 19, Some Monomers, Plastics and Synthetic Elastomers, and Acrolein," World Health Organization, Lyron, France.

National Institute for Occupational Safety and Health (NIOSH), 1983, "Registry of Toxic Effects of Chemical Substances, Data Base," Washington, D.C.

National Toxicology Program (NTP), 1982, "Carcinogenesis Bioassay of Vinylidene Chloride (CAS No. 75-35-4) in F344 Rats and B6C3F$_1$ Mice (Gavage Study)," NTP Technical Report Series No. 228, Washington, D.C. DHHS Publication No. (NIH) 82-1784.

U.S. Environmental Protection Agency (USEPA), 1979, "Water-Related Environmental Fate of 129 Priority Pollutants," Washington, D.C., December 1979, EPA 440/4-79-029.

U.S. Environmental Protection Agency (USEPA), 1980, "Ambient Water Quality Criteria for Dichloroethylenes," Office of Water Regulations and Standards, Criteria and Standards Division, Washington, D.C., October 1980, EPA 440/5-80-041.

U.S. Environmental Protection Agency (USEPA), 1984, "Health Effects Assessment for 1,1-Dichloroethylene, Final Draft," Environmental Criteria and Assessment Office, Cincinnati, Ohio, September 1984, ECAO-CIN-H051.

U.S. Environmental Protection Agency (USEPA), 1985, "Health Assessment Document for Chloroform," Office of Health and Environmental Assessment, Washington, D.C., September 1985, EPA 600/8-84/004F.

Verschueren, K., 1977, "Handbook of Environmental Data on Organic Chemicals," Van Nostrand Reinhold Company, New York, 659 pages.

Weast, R. E., ed., 1981, "Handbook of Chemistry and Physics," 62nd ed., CRC Press, Cleveland, Ohio, 2,332 pages.

APPENDIX B

FORMS

REMCOR

MEMO

TO: _____ Date: _____

FROM: L. K. Scholl Project No.: _____

SUBJECT: REMCOR MEDICAL SURVEILLANCE PROGRAM

All hazardous waste site workers must undergo a pre-employment medical examination. You have been scheduled for an entrance exam on:
(Date and Time) at: _____
(Name and Address of Clinic or Physician)
Please do not eat or drink anything (except water) after midnight the night before.

Please note the exam will include a drug and alcohol screening test. This physical exam will be paid for by Remcor.

Please fill out the attached forms and give them to the nurse or doctor. Results of the exam will be made available to you upon request.

A successful completion of this initial exam is required for work at hazardous waste sites.

A complete annual physical examination is required by law for hazardous waste workers and will be provided by Remcor.

Upon termination of employment, an exit physical exam is required if it has been six or more months since your last examination and/or it is the option of Remcor. It is Remcor policy to have the exit exam completed before the final paycheck is issued.

I have read, understood, and agree to comply with Remcor's Medical Surveillance Programs.

_____ _____
Linda K. Scholl (Signed)
Corporate Health & Safety Officer

Original: Corporate H/S File
Copy: Employee
Copy: Project File

REMCOR

ORGANIC VAPOR MONITORING CHECKLIST

Project:

Location:

Instrument:

Serial Number:

Calibration Gas: 1. Compound_____2.Concentration_____

Calibrate Daily Before Use

Date	Time	Reading	Analyst	Notes

REMCOR

VISITORS LOG

Project Name:

Project Number:

Date	Time In/Out	Name/Representing	Purpose of Visit	Safety Briefing Y/N : By	Protective Equip. Issued Y/N : Level

AR300401

REMCOR

TO: (Name and Address of Physician or Clinic)

DATE:

Sir or Madam:

You have been requested to provide Remcor, Inc. (Remcor) employees with a medical examination and laboratory studies prior to and during their employment in hazardous waste operations. Remcor is a full-service hazardous waste management company which provides services to a variety and number of clients. Our work involves the investigation and cleanup of a wide range of hazardous waste facilities and the possible presence of a number of hazardous materials.

In December, 1986 the United States Department of Labor Occupational Safety and Health Administration (OSHA) published a rule which applies specifically to workers at hazardous waste operations. I have enclosed a copy of this rule in compliance with OSHA's Medical Surveillance requirements.

Remcor thanks you for your cooperation and assistance enabling us to provide quality medical evaluations and examinations to our employees.

If you have any questions, please do not hesitate to call.

Very truly yours,

Linda K. Scholl
Senior Scientist
Corporate Health and
Safety Officer

LKS:cac

Enclosure

REMCOR

Project Name: _____

By: _____ Project No.: _____

Date: _____ Sheet _____ of _____

Time: Start _____ Finish _____

TRAINING SESSION DOCUMENTATION RECORD

Instructor: _____

Material Covered: _____

_____

_____

ATTENDEES

NAME (print)	SIGNATURE

Routing: Site File (copy) ____
Project Files ____

JOBSITE SAFETY CHECKLIST

Project | Project No. | Person Making Inspection

Jobsite Location | Date of Inspection

A. Adequate at time of inspection.	**C.** Item not applicable.
B. Needs immediate attention.	**N/A** No items in section applicable.

Check one of the following: A B C

A. Posters & Records N/A ☐

1. OSHA poster displayed? ☐ ☐ ☐
2. Foremen holding weekly safety meetings — recording? ☐ ☐ ☐
3. Emergency medical numbers posted? ☐ ☐ ☐
4. Explosives inventory current? ☐ ☐ ☐
5. Copy of OSHA regulations on jobsite? ☐ ☐ ☐
6. Have utility contacts been made/recorded? ☐ ☐ ☐
7. Are safety talk subjects available? ☐ ☐ ☐
8. Blank accident report forms available? ☐ ☐ ☐
9. Using Employment Applications before hiring? ☐ ☐ ☐
10. Are Safety posters being displayed? ☐ ☐ ☐

B. Housekeeping & Sanitation N/A ☐

11. General housekeeping of jobsite? ☐ ☐ ☐
12. Passageways and walkways clear? ☐ ☐ ☐
13. Nails removed from lumber? ☐ ☐ ☐
14. Materials of all types properly stockpiled? ☐ ☐ ☐
15. Is an area provided for waste and trash and is it removed regularly? ☐ ☐ ☐
16. Adequate lighting in passageways, stairways and work areas? ☐ ☐ ☐
17. Toilet facilities adequate and clean? ☐ ☐ ☐
18. Sanitary supply of drinking water? ☐ ☐ ☐
19. Disposable drinking cups and refuse container? ☐ ☐ ☐
20. Means provided for sanitizing personal protective equipment? ☐ ☐ ☐

C. Fire Protection N/A ☐

21. Are "No Smoking" or "Flammable" signs posted at all storage and fueling locations? ☐ ☐ ☐
22. Clear access provided to all fire fighting equipment/are inspections recorded? ☐ ☐ ☐
23. Location of all fire fighting equipment prominently marked? ☐ ☐ ☐
24. Are flammable liquids stored in approved containers? ☐ ☐ ☐
25. Fire extinguishers adequate size? ☐ ☐ ☐
26. Large fuel tanks properly diked and separated? ☐ ☐ ☐

D. First Aid N/A ☐

27. First Aid Kits well stocked? ☐ ☐ ☐
28. Trained first-aider on jobsite? ☐ ☐ ☐

Check one of the following: A B C

E. Electrical N/A ☐

29. Distribution boxes covered or marked? ☐ ☐ ☐
30. GFI's in use or positive grounding been tested? ☐ ☐ ☐
31. Temporary lighting protected? ☐ ☐ ☐

F. Tools N/A ☐

32. Damaged or broken tools tagged out of service? ☐ ☐ ☐
33. Proper storage space provided? ☐ ☐ ☐
34. Operative guards on all power tools? ☐ ☐ ☐
35. Persons using powder actuated tools certified? ☐ ☐ ☐
36. Are guards provided on grinders? ☐ ☐ ☐
37. Airhose couplers secured or safety valve in line? ☐ ☐ ☐
38. Tools being properly used? ☐ ☐ ☐
39. Correct personal protection being used? ☐ ☐ ☐
40. Extension cords tested for assured ground? ☐ ☐ ☐

G. Structures N/A ☐

41. Floor openings covered or guardrailed? ☐ ☐ ☐
42. Standard guardrailing on scaffolds, bridge decks, floors of buildings, work platforms and walkways? ☐ ☐ ☐
43. Work areas clear of debris, snow, ice, and grease? ☐ ☐ ☐
44. Adequate fire protection? ☐ ☐ ☐
45. Stairways provided with handrails? ☐ ☐ ☐
46. Hollow pan-treads filled with solid material? ☐ ☐ ☐
47. Ladders properly constructed? ☐ ☐ ☐
48. Side rails of ladders extend 36" above landing? ☐ ☐ ☐
49. Scaffolds properly anchored, braced and plumb? ☐ ☐ ☐
50. Protection provided over vertical rebars when working above? ☐ ☐ ☐
51. Safety belts in use when guardrails are absent? ☐ ☐ ☐
52. Employees clear of swinging crane loads? ☐ ☐ ☐
53. Tag lines used on suspended crane loads? ☐ ☐ ☐
54. Gas cylinders separated, secured upright and capped if not in use? ☐ ☐ ☐
55. Safety lines in use on suspended scaffolds? ☐ ☐ ☐
56. Heating devices properly ventilated? ☐ ☐ ☐
57. Gates functioning on all levels when material or personnel hoists used? ☐ ☐ ☐
58. Safe procedures being used to wreck forms? ☐ ☐ ☐

REMCOR

A. Adequate at time of inspection.	**C.** Item not applicable
B. Needs immediate attention.	**N/A** No items in section applicable.

Check one of the following:

	A	B	C
H. Traffic Control N/A ☐			
59. Advance signing at approaches to work areas?	☐	☐	☐
60. Correct message on signs?	☐	☐	☐
61. Traffic control set-up on highways meet ODOT regulations?	☐	☐	☐
62. Flag persons properly dressed and equipped?	☐	☐	☐
63. Flag persons performing properly?	☐	☐	☐
I. Welding & Cutting N/A ☐			
64. Using right type eye protection?	☐	☐	☐
65. Gages, valves, torches and lines in good condition and free of oil and grease?	☐	☐	☐
66. Cylinders not in use capped?	☐	☐	☐
67. Cylinders in use or storage secured upright?	☐	☐	☐
68. Anti-flashback valves at torch?	☐	☐	☐
69. Stored oxygen separated from acetylene by 20 ft.?	☐	☐	☐
70. Fire extinguisher near welding or cutting operations?	☐	☐	☐
71. Adequate ventilation provided?	☐	☐	☐
72. Grounding for arc welding machine?	☐	☐	☐
73. All parts of arc welding outfits properly insulated?	☐	☐	☐
J. Heavy Equipment N/A ☐			
74. Operators wearing hard hats?	☐	☐	☐
75. Hearing protection being used?	☐	☐	☐
76. Dust Control?	☐	☐	☐
77. Haul road adequate and maintained?	☐	☐	☐
78. Equipment speeds excessive for safety?	☐	☐	☐
79. Horns and back-up alarms functioning?	☐	☐	☐
80. Clearing cabs on machines when clearing?	☐	☐	☐
81. Engines shut-down when refueling or lubricating?	☐	☐	☐
82. Seat belts on machines with ROPS?	☐	☐	☐
83. Steps and hand holes adequate and safe condition?	☐	☐	☐
84. Adequate lighting of haul roads at night?	☐	☐	☐
85. Parked or unattended equipment have blade lowered to the ground?	☐	☐	☐
86. No hitchhikers riding on equipment?	☐	☐	☐
87. Full fire extinguisher near refueling tank?	☐	☐	☐
88. Dump man prominently located?	☐	☐	☐
89. Overhead guard on fork lift truck?	☐	☐	☐
90. Vehicles with restricted rear visibility equipped with operating back-up alarms?	☐	☐	☐
K. Cranes N/A ☐			
91. Power line distance from machines?	☐	☐	☐
92. Annual inspection?	☐	☐	☐
93. Cables in safe condition?	☐	☐	☐
94. Rear swing protection and pinch point guarding?	☐	☐	☐
95. Exposed gears, shafts and belts guarded?	☐	☐	☐
96. Fire extinguisher, boom angle indicator, load capacity chart and hand signal poster in crane?	☐	☐	☐
97. Signs and/or flags on cranes in transit?	☐	☐	☐
98. Operator making daily inspections and tests?	☐	☐	☐
L. Trenching & Excavations N/A ☐			
99. Trench side shored, layed back or boxed?	☐	☐	☐
100. Utilities contacted and located before digging?	☐	☐	☐
101. Ladder in the trench?	☐	☐	☐
102. Stop logs placed where necessary along top of the trench?	☐	☐	☐

Check one of the following:

	A	B	C
103. Excavated material stockpiled far enough from the edge of the trench?	☐	☐	☐
104. Laser warning signs in place?	☐	☐	☐
105. Adequate ventilation in pipe?	☐	☐	☐
106. Traffic control adequate?	☐	☐	☐
107. Sides of excavation for building shored or protected?	☐	☐	☐
108. Oxygen level tested in tunnel, shafts or confined space?	☐	☐	☐
109. Public protected from exposure to open excavation?	☐	☐	☐
M. Miscellaneous N/A ☐			
110. Sufficient quantities of approved personal protective equipment on the jobsitse?	☐	☐	☐
111. Procedures established to handle toxic and carcogenic materials?	☐	☐	☐
112. Sewers, vaults, tanks and bins tested for adequate oxygen levels before employees are permitted to enter?	☐	☐	☐
113. Everyone wearing hard hat?	☐	☐	☐
114. Fall protection being used on steel erection?	☐	☐	☐
115. Walls properly braced (concrete and block construction)?	☐	☐	☐
116. Toxic fumes, vapors and dusts present, is ventilation adequate?	☐	☐	☐
117. Guards in place and used on wood working machines?	☐	☐	☐
118. Explosives being used, transported and stored in compliance with regulations?	☐	☐	☐
119. Blaster following all safety precautions?	☐	☐	☐
120. Tunneling operations/lighting and ventilation adequate?	☐	☐	☐
121. Belts, pulleys, shafts, gears and chains guarded on all machinery and equipment?	☐	☐	☐
122. Masonry saws grounded and personal protective equipment being used?	☐	☐	☐
123. Exit signs over doors in offices and storage buildings?	☐	☐	☐

*This checklist does not include all hazards on every job, but is intended to remind you of most common hazards.

Unsafe acts and/or practices observed:

_____

_____

_____

_____

_____

_____

_____

I the undersigned superintendent have reviewed the indicated hazards and will take the necessary action to immediately correct them.

_____

Signature of Project Supervisor

REMCOR

PERSONNEL ENTERING CONTAMINATED AREAS

PRO CLO LEVEL	EMPLOYEE	TIME IN	TIME OUT	TIME IN	TIME OUT

Level A -
Level B - Supplied Air
Level C - Respirator
Level D -

Project No.: _____

Date: _____

REMCOR

SITE PERSONNEL DATA RECORD

EMPLOYEE NAME: _____

START DATE: _____ POSITION: _____

ADDRESS: _____

_____

HOME PHONE NO. _____

LOCAL PHONE NO. _____

TO BE NOTIFIED IN CASE OF INJURY/ILLNESS:

NAME: _____ RELATIONSHIP: _____

ADDRESS: _____ PHONE: WORK _____

_____ HOME _____

CLIENT: _____ LOCATION: _____